UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/619,874	07/14/2003	Hideki Kitao	50710/DBP/A400	7817

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EXAMINER
WOZNIAK, JAMES S

ART UNIT	PAPER NUMBER
2626	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

<table>
<tr><td rowspan="2">Office Action Summary</td><td>Application No.
10/619,874</td><td>Applicant(s)
KITAO ET AL.</td></tr>
<tr><td>Examiner
James S. Wozniak</td><td>Art Unit
2626</td></tr>
</table>

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE **3** MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 October 2007*.

2a)☒ This action is **FINAL**.   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *11-17* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *11-17* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *14 July 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☒ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application

6)☐ Other: _____.

DETAILED ACTION

Response to Amendment

1.   In response to the office action from 6/20/2007, the applicant has submitted an

amendment, filed 10/22/2007, amending canceling claims 1-10, while adding new claims 11-17

and arguing to traverse the art rejection based on the limitation regarding the use of an auto-

correlation value to detect a speech signal *(Amendment, Page 7)*. Applicant's arguments have

been fully considered, however the previous rejection is maintained, altered with respect to the

amended claims and due to the reasons listed below in the response to arguments.

2.   In response to the cancellation of claims 1-10, the examiner has with drawn the previous

objections directed to minor informalities.

Response to Arguments

3.   Applicant's arguments have been fully considered but they are not persuasive for the

following reasons:

With respect to **Claim 11**, the applicant argues that Stettiner et al *(U.S. Patent:*

4,959,865) fails to teach detection of a speech section based on an auto-correlation value of a

speech signal because it is alleged that Stettiner teaches that the calculated auto-correlation value

of the speech signal oscillates between positive and negative values and exhibit a low signal-to-

noise ration at the end and beginning of a speech signal, which would result in an erroneous detection *(Amendment, Page 7)*. The applicant points to Col. 4, Lines 54-63 in Stettiner in support of these arguments.

In response, the examiner notes that the passage referred to in the Stettiner reference *(Col. 4, Lines 47-68)* and further cited passages *(Col. 6, Line 25- Col. 7, Line 25)* specifically note that a short time autocorrelation function is utilized as a measure of speech section detection. As such, the claimed use of an autocorrelation value for speech section detection is taught by the prior art of record, and thus, the applicant's arguments have been fully considered, but art not convincing. Furthermore, the applicant's argument that Stettiner's invention would lead to erroneous detection is moot because, as noted above, Stettiner meets the requirement of using a short-time autocorrelation for speech signal detection. It is, however, worth pointing out that Stettiner teaches means for safeguarding against the erroneous detections mentioned by the applicants *(Col. 4, Lines 63-68)* to enable more reliable speech detection. Thus, for at least the above reasons, Stettiner discloses the aforementioned claim limitation.

The applicant further argues that Stettiner fails to teach calculating an RMS value of the short-time autocorrelation value, smoothing the RMS value, and setting as a threshold value the product obtained by multiplying the smoothed RMS by a predetermined factor in a non-speech section. These arguments fail to comply with 37 CFR 1.111(b) because they amount to a general allegation that the claims define a patentable invention without specifically pointing out how the language of the claims patentably distinguishes them from the references. Also, these claim limitations appear to somewhat relate to previous claim 7. The rejection of this canceled claim relied on the teachings of Junqua *(U.S. Patent: 5,305,422)*, which was not addressed in the

response. Thus, in response to such arguments, see the below rejection in view of Junqua (U.S.

Patent: 5,305,422).

Dependent claims 12-17 are argued as being allowable over the prior art of record for

reasons similar to Claim 11. In regards to such arguments, see the response directed to claim 11.

Claim Objections

4. **Claim 12** is objected to because of the following informalities: "the number of

additions" should be changed to –a number of additions-- in order to provide proper antecedent

basis for this limitation in the claim.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. **Claims 11, 13, and 15-17** are rejected under 35 U.S.C. 103(a) as being unpatentable over

Stettiner et al *(U.S. Patent: 4,959,865)* in view of Junqua *(U.S. Patent: 5,305,422)*.

With respect to **Claim 11**, Stettiner discloses:

Signal-to-noise ratio improving means including a short-time auto-correlation value

calculating means for calculating a short-time auto-correlation value based on a stored speech

signal *(short-term auto-correlation means that suppresses peaks due to non-speech factors, Col.*

4, Lines 31-68; and speech signal from a memory buffer, Fig. 1, Element 18); and

Speech section extracting signal generating means for generating a speech section

extracting signal for extracting a speech section in said speech signal in response to a

determination that a level of said short-time auto-correlation value calculated by said short-time

auto-correlation value calculating means has continued to stay above a predetermined threshold

value for a predetermined length of time *(speech presence decision, Col. 6, Line 25- Col. 7, Line*

25, which produces an extracted speech signal by closing a switch to pass a detected speech

segment and opening a switch to block non-speech segments, Col. 3, Lines 20-24; and time

determination of pitch consistency longer than a predetermined duration, Col. 7, Lines 39-54,

which corresponds to autocorrelation values exceeding a threshold longer than a predetermined

duration, Col. 6, Lines 34-46; and Col. 7, Lines 5-25).

Stettiner does not specifically suggest calculation of an RMS from speech parameters and

that a threshold can be updated in a non-speech region by multiplying a smoothed RMS by a

predetermined factor. Such RMS calculation from speech parameters (Col. 7, Lines 56-67) and

threshold updating processes are well-known in the art, however, as is evidenced by Junqua

(multiplying a calculated average (i.e., smoothed) RMS correlation difference by a

predetermined factor to set a new threshold, Col. 2, Lines 32-41).

Stettiner and Junqua analogous art because they are from a similar field of endeavor in

speech detection systems. Thus, it would have been obvious to a person of ordinary skill in the

art, at the time of invention, to modify the teachings of Stettiner with the threshold updating

means taught by Junqua in order to implement a speech detection system that is capable of

adapting to a variety of noise environments *(Junqua, Col. 1, Lines 50-58)*.

With respect to **Claim 13**, Stettiner further discloses:

Preprocessing means for removing noise contained in said stored speech signal, wherein

said signal-to-noise ratio improving means improves the signal-to-noise ratio of said speech

signal from which noise has been removed by said preprocessing means *(low-pass filter for*

removing noise, Col. 3, Lines 53-58 in a preprocessor, Fig. 1, Elements 20 and 32).

With respect to **Claim 15**, Stettiner further discloses:

Gate signal generating means for generating a gate signal for opening and closing a gate

means for extracting the speech section related to said speech signal in response to the

determination that said short-time auto-correlation value calculated by said short-time auto-

correlation value calculating means has continued to stay above said threshold value for a

predetermined length of time *(determination of pitch consistency longer than a predetermined*

duration, Col. 7, Lines 39-54, which corresponds to autocorrelation values exceeding a

threshold longer than a predetermined duration, Col. 6, Lines 34-46; and Col. 7, Lines 5-25; and

the switch taught by Stettiner and applied to claim 1 that passes a speech signal as a result of

such a continually exceeded threshold); and

Gate signal retroactively opening means for outputting a gate signal for retroactively

opening said gate means for a predetermined period in response to said gate means being set

open by said generated gate signal. *(backwards extension, Col. 7, Line 55- Col. 8, Line 37)*.

With respect to **Claim 16**, Stettiner further discloses:

Gate signal generating means for generating a gate signal for opening and closing a gate means for extracting the speech section related to said speech signal in response to the determination that said short-time auto-correlation value calculated by said short-time auto-correlation value calculating means has continued to stay above said threshold value for a predetermined length of time *(determination of pitch consistency longer than a predetermined duration, Col. 7, Lines 39-54, which corresponds to autocorrelation values exceeding a threshold longer than a predetermined duration, Col. 6, Lines 34-46; and Col. 7, Lines 5-25; and the switch taught by Stettiner and applied to claim 1 that passes a speech signal as a result of such a continually exceeded threshold)*; and

Gate signal open state maintaining means for outputting a gate signal for maintaining said gate means in an open state for a predetermined period in response to said gate means being set closed by said generated gate signal after said gate means has been opened by said generated gate signal *(forward extension, Col. 7, Line 55- Col. 8, Line 43)*.

Claim 17 contains subject matter similar to Claims 15 and 16, and thus, is rejected for the same reasons.

7. **Claims 12** are rejected under 35 U.S.C. 103(a) as being unpatentable over Stettiner et al in view of Junqua and further in view of Iizuka et al *(U.S. Patent: 6,952,670)*.

With respect to **Claim 12**, Stettiner in view of Junqua discloses the speech presence determiner that calculates and utilizes a short-term auto-correlation value in speech period detection, as applied to Claim 11. Stettiner further discloses a low-pass filter for removing noise *(Col. 3, Lines 53-58)*. Stettiner in view of Junqua does not explicitly disclose an equation used to

calculate such an auto-correlation value, specifically the equation recited in claim 12. Iizuka, however, discloses a noise/speech segment determination apparatus that utilizes an equation similar to the one recited in claim 2 to determine an auto-correlation coefficient *(Col. 26, Lines 17-30)*.

Stettiner, Junqua, and Iizuka are analogous art because they are from a similar field of endeavor in speech detection systems. Thus, it would have been obvious to a person of ordinary skill in the art, at the time of invention, to modify the teachings of Stettiner in view of Junqua with the auto-correlation coefficient calculating equation taught by Iizuka in order to provide a specific well-known means for obtaining parameters for rendering a decision about the presence or absence of speech within an audio signal *(Stettiner, Col. 4, Lines 47-50)* with a high level of reliability *(Iizuka, Col. 6, Lines 20-25)*.

8. **Claim 14** is rejected under 35 U.S.C. 103(a) as being unpatentable over Stettiner et al in view of Junqua and further in view of Shinta et al *(U.S. Patent: 5,315,704)*.

With respect to **Claim 14**, Stettiner in view of Junqua discloses the speech presence determiner that utilizes a low-pass filter, as applied to Claims 1 and 13. Stettiner in view of Junqua does not explicitly teach that a high-pass filter is utilized in addition to a low-pass filter, however, Shinta discloses the use of such filters in a speech discriminator *(Col. 8, Lines 60-65)*.

Stettiner, Junqua, and Shinta are analogous art because they are from a similar field of endeavor in speech detection systems. Thus, it would have been obvious to a person of ordinary skill in the art, at the time of invention, to modify the teachings of Stettiner in view of Junqua with the high-pass filter taught by Shinta in order to cut-off low frequency noise to further focus

speech detection processing on the specific frequency band referred to by Stettiner *(Col. 3, Lines 53-58)*.

Conclusion

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: See PTO-892.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to James S. Wozniak whose telephone number is (571) 272-7632. The examiner can normally be reached on M-Th, 7:30-5:00, F, 7:30-4, Off Alternate Fridays.
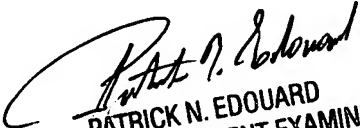
If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Patrick Edouard can be reached at (571) 272-7603. The fax phone number for the

organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent

Application Information Retrieval (PAIR) system. Status information for published applications

may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

applications is available through Private PAIR only. For more information about the PAIR

system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR

system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

James S. Wozniak
12/14/2007

PATRICK N. EDOUARD
SUPERVISORY PATENT EXAMINER